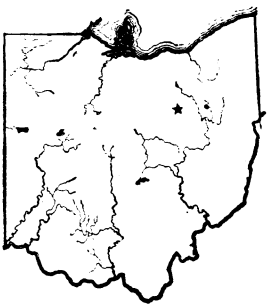
THIRTY-FIFTH ANNUAL REPORT
FOR 1915-16

OHIO
Agricultural Experiment Station

WOOSTER, OHIO, U. S. A., JUNE, 1916

BULLETIN 300



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Thirty-Fifth Annual Report

OF THE

Ohio Agricultural Experiment Station

For the Year ended June 30, 1916

Published by order of the State Legislature

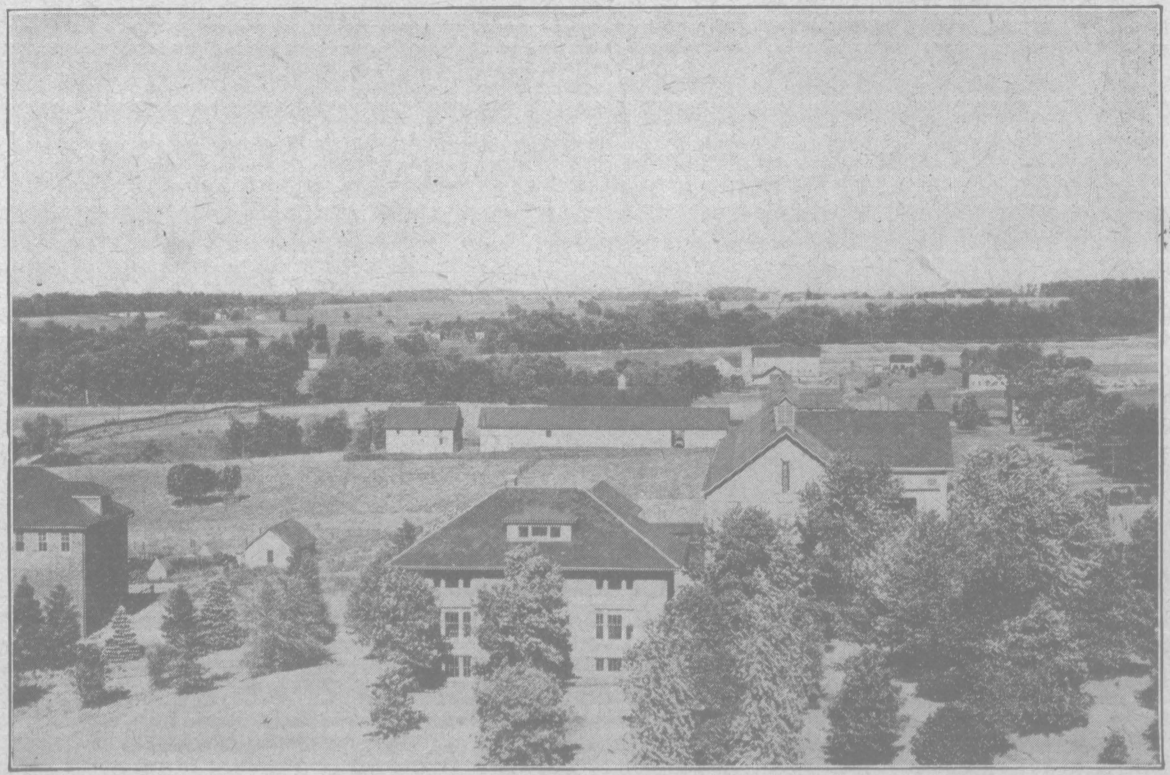
WOOSTER, OHIO
EXPERIMENT STATION PRESS
1916

HON. F. B. WILLIS,

Governor of Ohio:

SIR: I have the honor to transmit herewith the Thirty-fifth Annual Report of the Ohio Agricultural Experiment Station, for the year ended June 30, 1916.

GEORGE E. SCOTT, *President*,
Board of Control.



View looking east from the tower of the Administration Building, Ohio Agricultural Experiment Station.

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J. B. KEIL, *Orchard Assistant*
S. N. GREEN, *Garden Assistant*

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S. N. RHUE, B. S., *Assistant*
C. E. MANGELS, A. M., *Assistant*

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E. R. ALLEN, Ph. D., *Asso. in soil biology*
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OLIVER GOSSARD, B. S., *Assistant*
OLIN H. SMITH, B. S., *Assistant*
A. H. HUISKEN, M. S., *Assistant*
H. J. CONLIN, B. Chem., *Assistant*

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F. N. MEEKER, B. A., *Assistant*
H. L. ANDREW, B. S., *Assistant*

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J. PAUL MARKLEY, *Resident Manager*

Southwestern Test-Farm, Germantown
HENRY M. WACHTER, *Resident Manager*

Southeastern Test-Farm, Carpenter
H. D. LEWIS, *Resident Manager*

Northwestern Test-Farm, Findlay
JOHN A. SUTTON, *Resident Manager*

County Experiment Farms

Miami County Experiment Farm, Troy
GEO. R. EASTWOOD, B. S., *Agent in Charge*

Paulding County Experiment Farm, Paulding
H. A. RAY, *Foreman*

Clermont Co. Experiment Farm, Owensville
S. B. STOWE, B. S., *Agent in Charge*

Hamilton Co. Experiment Farm, Mt. Healthy
D. R. VAN ATTA, B. S., *Agent in Charge*

Washington County Experiment Farms, Fleming and Marietta

Mahoning Co. Experiment Farm, Canfield
D. W. GALEHOUSE, *Agent in Charge*

Trumbull Co. Experiment Farm, Cortland
M. O. BUGBY, B. S., *Agent in Charge*

ANNOUNCEMENT

The Ohio Agricultural Experiment Station is organized under an act of the General Assembly of Ohio, passed April 17, 1882, and supplemented by an act of Congress, approved March 2, 1887.

WHAT THE STATION CAN DO

The Station offers its advice and assistance to the farmers of Ohio along the following lines:

The maintenance of soil fertility, including the rotation of crops and the selection and use of manures and fertilizing materials.

The selection of varieties of grains, grasses and forage crops and methods of culture.

The selection of varieties of fruits and vegetables and the management of orchards.

The examination of seeds that are suspected of being unsound or adulterated; the identification of grasses, weeds and other plants; the prevention of fungous diseases and plants.

The identification of insects and the control of such as are injurious.

The feeding of animals, including calculation of rations and use of various feeding stuffs.

The planting and care of forest trees and the management of farm woodlots.

WHAT THE STATION CANNOT DO

For advice and assistance along the following lines, application should be made to the OHIO STATE BOARD OF AGRICULTURE, Columbus, not to the Experiment Station.

The analysis of commercial fertilizers, of lime or limestone for agricultural purposes, and of feeding stuffs.

The treatment of contagious diseases of animals.

The inspection of orchards and nurseries for the control of San Jose scale.

The examination of foods, drugs, and dairy products suspected of being adulterated.

The Station is not prepared to analyze drinking water; requests for such analysis should be addressed to the SECRETARY OF THE STATE BOARD OF HEALTH, Columbus.

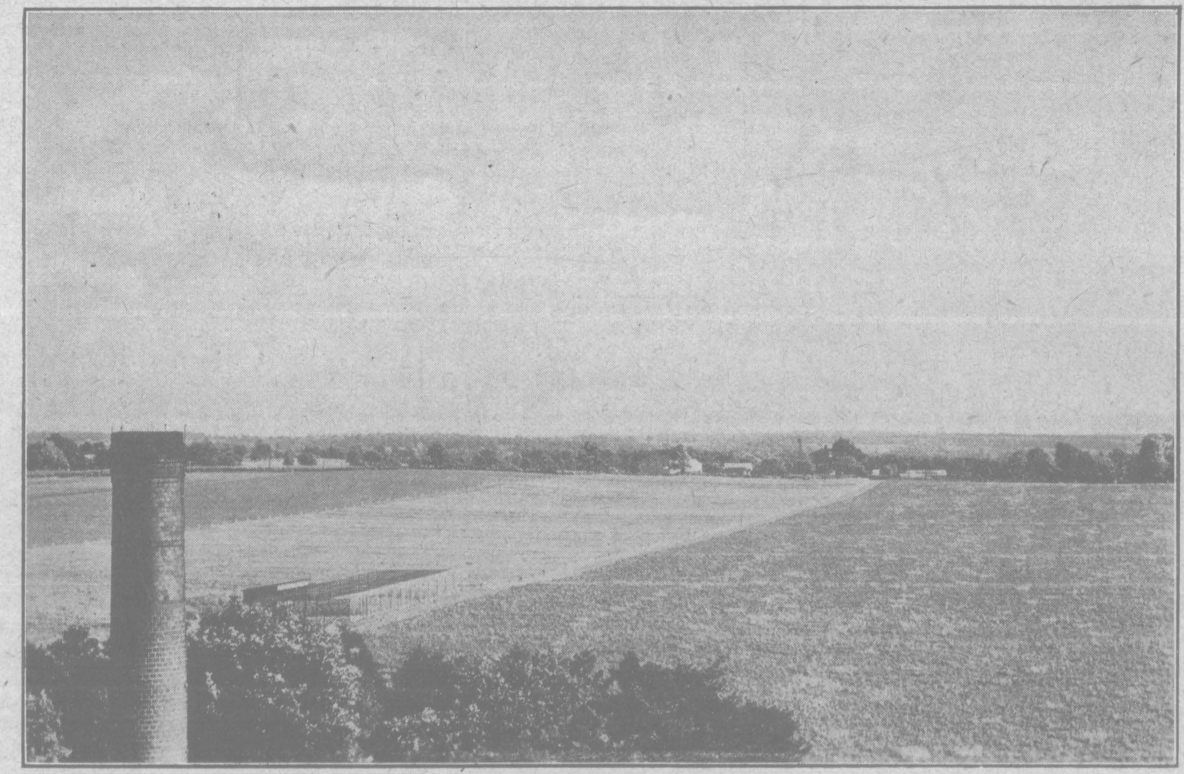
Visitors to the Station or its various test farms are welcome at all times during business hours. Persons or parties who contemplate such visits and who desire special attention are requested to write in advance, giving date of proposed visit and probable number of party.

Any citizen of Ohio has the right to apply to the Station for such assistance as it can give, and all such requests will receive prompt attention.

The Bulletins of this Station are sent free to all residents of the State who request them.

Address all communications to

EXPERIMENT STATION,
Wooster, Ohio.



View looking south from the tower of the Administration Building, Ohio Agricultural Experiment Station.

REPORT OF THE DIRECTOR

HON. GEORGE E. SCOTT,
President of the Board of Control.

Sir: I have the honor of submitting the thirty-fifth annual report on the work of the Ohio Agricultural Experiment Station, for the year ended June 30, 1916.

STATE FORESTS

Under authority of the law enacted at the last session of the General Assembly, introduced by Hon. Edward F. Bohm, of Cuyahoga County, two tracts of forest land have been purchased, one of 221½ acres in the southwestern part of Athens County, about 1½ mile from Mineral, on the Baltimore & Ohio Southwestern Railway, and the other of 1,500 acres at Dean, Lawrence County, the terminal junction of branches of the D. T. & I. and C. H. & D. Railways.

The price paid for the smaller tract was $9 an acre. About half of it has been cleared and cultivated in farm crops, and the remainder is covered with thrifty young timber. The best parts of the cleared land will be used for forest nursery purposes, while the steeper hillsides will be returned to forest.

The Lawrence County tract was very valuable half a century ago because of its iron ore, which lies so near the surface as to be obtained by quarrying, and which was smelted by use of charcoal made from the trees growing on the land, all of which has been cut over once and part twice for this purpose. The advent of the higher grade ores from the iron fields of Missouri and Minnesota, and of cheaper fuel from the coal mines of southeastern Ohio, has made the working of this ore unprofitable, and as the land is too rough for cultivation its chief value is for the production of forest trees. It is now covered with a dense growth of young trees, largely white oak, which with a little thinning out of weed trees and protection from fire will grow into timber of great value.

The price paid for this land was $4.50 an acre. There are thousands of acres of similar land in southern Ohio which is at present returning no income, but which may be made a source of large future revenues to the State by conservative management.

The purchase and holding of such land is not an enterprise to attract private capital, for the reason that no income can be expected for a considerable period, and meanwhile there must be some outlay for the care of the forest and its protection from fire and vandalism; but the State not only is better able to exercise such care and protection than any private individual or corporation, but is in duty bound to conserve its resources for the benefit of future generations.

The study of the conditions of variety, soil and treatment essential to the production of a forest crop of the highest value is as legitimate a function of the Experiment Station as is the similar study of any other farm crop.

INVESTIGATIONS IN PROGRESS

A list of the principal subjects under investigation in the several departments of the Station was given in my last report (Bulletin 288). These investigations are being continued, and the following additions to, or changes in the work have been made during the year.

AGRONOMY

Alfalfa and clover.—A test of 15 varieties and regional strains of alfalfa.

The value of clover in fertility maintenance.

The effect of scarifying clover and alfalfa seed with the Ames scarifier.

The comparative value of seed testing different weights per bushel.

Corn.—A comparison of the nutritive values of silage made from early and late maturing varieties, in cooperation with the Departments of Animal Husbandry and Dairying.

Seasonal notes.—Alfalfa winter-killed badly during the season of 1915-16. The Grimm alfalfa did not withstand these conditions any better than the common strains from Kansas, Nebraska and the northwestern states.

Owing to excessive and continued rains during the oat harvest of 1915 the variety comparison of oats was lost on account of lodging and shelling.

Publications.—The results of experiments with wheat carried on during the last 15 years, together with reports of some earlier work, are given in Bulletin 298. Articles have been published in the *Monthly Bulletin* as follows: Experiments with oats (February), p. 35; Sudan grass (March), p. 67; The palatability of farm grasses (March), p. 70; Testing seed corn (March), p. 96; Varieties of soybeans (April), p. 99; Sorghum and millet (June), p. 168.

ANIMAL HUSBANDRY

Production of draft horses.—Twenty fillies, purchased as colts in 1915, are being fed comparative rations, which will be continued until the weaning of the first crop of foals.

Records are being kept of the cost of raising colts from brood mares used for farm work.

Beef cattle.—Data are being secured relative to the cost of production to different ages, including the cost of maintaining a beef breeding herd.

Heifers and steers are being compared for efficiency in beef production. (The Station's Angus herd now numbers 90 head.)

Sheep and sheep-feeding studies.—Influence of the ration on the amount of grease and scoured wool produced by breeding ewes and upon the rate of economy of gains made by the lambs.

Dry lot feeding compared with pasturing.

Corn silage and corn stover as roughage for wintering breeding ewes.

Forage crops for ewes and lambs.

Rations for fattening native lambs.

Cost of lamb production.

Inheritance of wool production.

Swine.—Rations for brood sows and suckling pigs.

Self feeders vs. hand feeding.

Effect of age upon rate and character of gain.

Poultry.—Trap-nest records are being supplemented with individual weights of eggs taken for 10 days or 2 weeks during heavy production and again in early autumn.

In meat production cockerels, capons and pullets will be compared on simple and variety rations, on range and in confinement.

For growing chicks natural and artificial brooding; light and heavy feeding; farm-grown and commercial feeds; shaded and nonshaded yards will be compared.

Publications.—Bulletin 291, Experiments with laying hens. Bulletin 294, Wool studies: Washing before shearing—Time of shearing. The following articles have appeared in the *Monthly Bulletin*: Substitutes for corn in winter rations for fattening swine (January), p. 3; Wool studies: Washing before shearing—Time of shearing (May), p. 131; Variety vs. simple rations for laying hens (June), p. 163.

BOTANY

Plant disease studies.—The smuts of barley and soybeans.

Propagation of disease-resistant strains of tomato at the Washington County Truck Farm, in cooperation with the Department of Horticulture.

The steaming of tobacco plant beds.

Publications.—Circular 156, How to disinfect tobacco plant beds from root-rot fungus (*Thielavia*). Disease susceptibility of apple varieties in Ohio (in Bulletin 290, being a revision of Circular 130). Articles in Volume I of the *Monthly Bulletin* as follows: Potato diseases and seed potatoes (January), p. 10; Seed and soil treatment for plant diseases (February), p. 43; Fruit-bud formation on apple trees (May), p. 143; Potato insurance (June), p. 175; The neck rot of white onions (June), p. 176.

CHEMISTRY

Soil studies.—Changes in nitrogen content of soil treated with manure and different phosphorus carriers.

Effect of fertilization on lime requirement of the soil.

Comparison of limestone of different grades of fineness.

Study of methods for determining lime requirement of soils.

Studies of factors contributing to soil acidity.

Sulphur in relation to soils and crops:

(a) Effect of sulphur and sulphates on crop yields.

(b) Influence of different carriers of sulphur on chemical conditions of the soil.

(c) Influence of supply or deficiency of sulphur on proteid content of plants.

Nitrogen studies.—Effect of reinforcing materials on the availability and conservation of nitrogen in manure.

Loss of nitrogen from manure in air drying, under conditions similar to field application.

Comparison of clover incorporated with the soil and spread on the surface.

Miscellaneous.—Distribution of nutrients in different varieties of silage corn.

Publications.—Bulletin 292, Sulphur in relation to soils and crops. The following articles have appeared in the *Monthly Bulletin*: Soil formation and composition (February), p. 46; Analyses of typical soils (March), p. 73; Conservation of potassium (May), p. 155. *The Journal of Industrial and Engineering Chemistry* has published the following articles: Comparison of lime requirement methods, by J. W. Ames and C. J. Schollenberger, Vol. 8, No. 3, p. 243, March, 1916; A modified method for determining carbon-free ash in plant substances, by G. E. Boltz, Vol. 7, No. 10, p. 859, October, 1915; Estimation of carbon dioxide as barium carbonate applied to the Marr method for determining carbonates in soil, by C. J. Schollenberger, Vol. 8, No. 5, p. 427, May, 1916. *Soil Science* for June, 1916, contains an article by J. W. Ames and C. J. Schollenberger on Accumulation of salts in Ohio soils.

DAIRYING

Herd improvement by selection of good sires and removal of poor cows is continuously in progress.

Calf meal mixtures are being tried on a small scale.

Farm dairy management is being studied on the district and county experiment farms in cooperation with the Department of Farm Management.

Corn silage.—In cooperation with the Departments of Agronomy and Animal Husbandry a test of the relative food values per acre of the silage of large ensilage corn and common field corn is being undertaken. It will probably extend over several years.

Publications.—Bulletin 289, Raising dairy heifers. *Monthly Bulletin*: Beets and mangels compared with silage for milk production (February), p. 49; Heavy silage vs. heavy grain feeding for dairy cows (May), p. 141.

ENTOMOLOGY

In this department special stress has been laid during the year on studies of the transmission of fire blight and possibly of peach yellows by insects, and on the control of the grape-berry worm.

Other work additional to the lines listed a year ago includes a county-wide experiment in wheat seeding with reference to the Hessian fly, made in Miami County in cooperation with the county agent, George R. Eastwood.

Publications.—Bulletin 293, The grape-berry worm; Bulletin 297, The clover leaf tyer. *Monthly Bulletin*: Recent trials of materials for controlling San Jose scale (January), p. 21; Carbon bisulphid and its uses for grain fumi-

gation (March), p. 86; Plant lice or aphids (April), p. 108; Spraying programs for the small home orchard and fruit garden (April), p. 103; Controlling the grape-berry worm (May), p. 145; The clover leaf tyer (June), p. 181. *Journal of Economic Entomology*: (February) Distribution of the periodical cicada in Ohio. Is the hive a center for the distribution of fire blight? Is aphid honey dew a medium for spreading blight? The clover leaf tyer. A new elm pest. The control of the grape-berry worm. Life history and notes on *Apateticus cynicus* and *maculiventris*. County cooperation to reduce Hessian fly (April). A new method of subterranean fumigation. Ohio State Horticultural Society, Report for 1916: Report of the committee on Entomology. Spray nozzles. Summary of the season's experiments with the newer insecticides. The role of insects as carriers of fire blight.

FARM MANAGEMENT

This department is charged with the management of the district and county experiment farms. The work of the county experiment farms for the year is reported in Bulletin 303.

FORESTRY

Propagation of forest trees.—Test of methods for controlling the "damping off" fungi of coniferous seedlings.

Forest management.—Natural regenerative studies in the different forest types of the State.

Publications.—*Monthly Bulletin*: Forest trees worth planting (February), p. 54; The yellow locust (May), p. 149.

HORTICULTURE

The special horticultural problems to be given most attention the present season are outlined as follows:

Soil improvement.—This consists in bringing up the fertility of garden soil by means of cover crops alone; cover crops reinforced with chemical fertilizers; manure alone; manure reinforced with chemical fertilizers.

Breeding fruit trees and vegetable plants for special purposes, such as producing types resistant to disease; also to improve strains as to prolificacy, appearance and adaptability to certain uses.

Pruning to hasten the fruit-bearing period of apple trees.

Cover crops.—A comparison as to the value of various cover crops in orchards and the use of fertilizers to improve such crops.

Fertility work in orchards and with several garden and fruit crops.

Publications.—Bulletin 290, Varieties of apples in Ohio. *Monthly Bulletin*: Sun-sprouted seed potatoes (January), p. 15; Spray formulas for the town lot (April), p. 114; Water-core of the King David apple (April), p. 117.

NUTRITION

The principal lines of work of the Department of Nutrition during the year 1915-16 have been a study of the metabolism of the milch cow, the results of which indicate a loss of mineral constituents from the skeleton during heavy milk production; and an investigation on the iodine content of foods.

Publications.—Bulletin 295, The mineral metabolism of the milch cow; Bulletin 299, The iodine content of foods. *Monthly Bulletin*: The mineral

nutrients in the feeding of swine (February), p. 61; Mineral nutrients in practical human dietetics (April), p. 123; The mineral requirements of the milch cow (June), p. 186.

SOILS

Soil survey.—The detail soil survey, conducted in cooperation with the Bureau of Soils, U. S. Department of Agriculture, is being continued. The surveys of Hamilton, Geauga, Lucas and Miami Counties have been completed. Sandusky, Marion and Mahoning Counties will be taken up next.

Publications.—*Monthly Bulletin*: Liming the corn crop (January), p. 28; Some extremes in Ohio soils (March), p. 77; A waste lime product (April), p. 101; Nitrification (May), p. 153; Shall we fertilize corn in the hill? (May), p. 159; Raw rock phosphate vs. acid phosphate (June), p. 188.

The foregoing brief summary must be taken in connection with the list of investigations enumerated in Bulletin 288 in order to obtain a comprehensive view of the entire activities of the Station.

The greater part of the Station's work is continuous. The time seldom comes when it can be said that an investigation is completed, but when sufficient data have been accumulated to justify tentative conclusions a report of progress is published in the form of a bulletin, and the investigator turns again to his work.

PUBLICATIONS

The following publications have been prepared during the year, viz:

Bulletin 289, pp. 1-30. Raising dairy heifers. By C. C. Hayden.

Bulletin 290, pp. 31-184. Varieties of apples in Ohio. By W. J. Green, Paul Thayer and J. B. Keil.

Bulletin 291, pp. 185-218. Experiments with laying hens. By W. J. Buss.

Bulletin 292, pp. 219-256. Sulphur in relation to soils and crops. By J. W. Ames and G. E. Boltz.

Bulletin 293, pp. 257-308. The grape-berry worm. By W. H. Goodwin.

Bulletin 294, pp. 309-322. Wool studies: Washing before shearing—Time of shearing. By J. W. Hammond.

Bulletin 295, pp. 323-348. The mineral metabolism of the milch cow. By E. B. Forbes and F. M. Beegle.

Bulletin 296, pp. 348-428. Ohio weather for 1915. By J. Warren Smith and C. A. Patton.

Bulletin 297, pp. 429-446. The clover leaf tyer. By H. A. Gossard.

Bulletin 298, pp. 447-484. Wheat experiments. By C. G. Williams.

Bulletin 299, pp. 485-546. The iodine content of foods. By E. B. Forbes and F. M. Beegle.

Circular 155, pp.1-4. The County Experiment Farm law.

Circular 156, pp. 5-8. How to disinfect tobacco beds from root-rot fungus. By A. D. Selby, True Houser and J. G. Humbert.

Monthly Bulletin, Volume I, Nos. 1-6.

CHANGE IN FORM OF PUBLICATION

The agricultural experiment station is an institution organized for the double purpose, first, of accumulating a body of definite knowledge upon which to construct a system of scientific education in agriculture, and, second, of giving direct assistance to the farmer in the practical operation of his farm.

Unless the station's work is so conducted as to serve the first of these purposes it cannot serve the second, for advice which is not founded upon accurate knowledge is quite as likely to be misleading and harmful as to be useful; but a record of scientific observations may be of very great service to the teacher or student and yet fail to meet the needs of the nontechnical reader.

This Station has endeavored to overcome the difficulties suggested above by the publication of two series of bulletins: a general series intended to serve both students and farmers, but especially the latter, and a "technical" series, designed primarily for the assistance of teachers, students and investigators.

It has been increasingly difficult, however, to maintain a line of demarcation between these two classes of publications. With the progress of the Station's work a steadily increasing proportion of its energies is directed to the investigation of fundamental principles. That this should be so is consequent both on the growing demand for the results of such investigation, due to the very great increase during recent years in the attention given to the sciences underlying agriculture, and on the fact that its long-continued experiments have resulted in a great accumulation of data having scientific value.

Moreover, special provision has been made for such work in the national law, known as the Adams Act, the appropriations under which are limited to work of this character.

For these reasons it has been decided to limit the original series of bulletins to technical reports on the Station's work, sending these only to persons who desire the full scientific record of its

work, and to publish for general distribution a "Monthly Bulletin," which will contain abstracts or summaries of the more technical bulletins and such papers of a general nature as have heretofore been published as circulars. This Monthly Bulletin will be issued near the first of each month, instead of at the irregular intervals at which the other bulletins have heretofore been distributed, and each number will contain several articles on timely subjects from different departments of the Station.

Hereafter, therefore, the original series of bulletins will be sent regularly only to libraries and to such persons as desire a technical record of the Station's work, while the Monthly Bulletin will be sent to the general public.

The bulletins of the original series will be advertised in the Monthly Bulletin, and copies of any issue will be sent free to any address on request.

It is hoped that this change will make for economy in publication and that it will result in greater usefulness both to the student and to the farmer.

PERSONNEL

The following changes in the personnel of the Station have taken place during the year:

APPOINTMENTS

L. L. Rummell, B. S., editor; F. M. Lutts, superintendent of fair exhibits; W. L. Robison, B. S., and D. G. Swanger, B. S., assistants in animal husbandry; R. R. Barker, B. S., assistant in chemistry; B. S. Davisson, M. A., W. C. Boardman, B. S., Oliver Gossard, B. S., and Olin H. Smith, B. S., assistants in soils; H. L. Andrew, B. S., assistant in farm management, and S. B. Stowe, B. S., agent in charge of Clermont County Experiment Farm.

TRANSFERS

M. C. Thomas, county agricultural agent and superintendent of the county experiment farm for Miami County, was transferred by the College of Agriculture to Marion County as agricultural agent, and George R. Eastwood, assistant in animal husbandry at the Experiment Station, was appointed to succeed Mr. Thomas in Miami County.

RESIGNATIONS

Horatio Markley, superintendent of fair exhibits, resigned in order to accept appointment as a member of the Board of Control. Other resignations were those of C. Ellis Bundy, agent in charge of Paulding County Experiment Farm; Victor Herron, agent in charge of Clermont County Experiment Farm, and John Woodard, assistant in soil survey.

Respectfully submitted,

CHAS. E. THORNE,

Director.

REPORT OF THE BURSAR

HON. GEORGE E. SCOTT, *President of the Board of Control,*

Sir: I respectfully submit the financial report of the Ohio Agricultural Experiment Station for the fiscal year ended June 30, 1916.

The following amounts were allotted to the Experiment Station by the Controlling Board out of the appropriation made by the last General Assembly to the Agricultural Commission:

Salaries	$130,780.00
Labor	50,000.00
Food supplies	25.00
Forage and veterinary supplies	15,000.00
Fuel supplies	5,000.00
Office supplies	2,200.00
Laundry, cleaning and disinfecting supplies	125.00
Refrigerating supplies	85.00
Botanical and agricultural supplies	2,700.00
General plant supplies	11,000.00
Highway materials	500.00
Building materials	3,000.00
General plant materials	2,000.00
Office equipment	1,000.00
Livestock	3,500.00
Motorless vehicles and equipment	500.00
Wearing apparel	25.00
Educational and recreational equipment	1,000.00
General plant equipment	18,000.00
General repairs	3,000.00
Light, heat and power	300.00
Transportation	17,800.00
Communication	405.00
Contingencies	1,000.00
General plant service	300.00
Rent	3,223.00
Insurance	50.00
Contributions	25.00
	$272,543.00

The last General Assembly provided an appropriation of $10,000 for the establishing of state forests, this amount being in addition to the allotment above.

In statements A, B, C, D, E, F and G will be found a record of the receipts and expenditures from the various funds; statements A and B being statements of account with the appropriation received from the United States Government and a copy of the report made to the Governor of the State, to the United States Secretary of

Agriculture, and to the Secretary of the United States Treasury; statement C being a statement of account with the United States Produce Fund; statement D being a statement of account with the State appropriations and the Produce Fund; statement E being a statement of account with the State appropriation for the establishing of state forests.

The five statements A, B, C, D and E are combined in statement F, which shows the total income and expenditures for the fiscal year.

Statement G is a balance sheet which shows the condition of each fund at the close of business, June 30, 1916.

Respectfully submitted,

W. H. KRAMER,

Bursar.

STATEMENT A

Hatch Fund

THE OHIO AGRICULTURAL EXPERIMENT STATION IN ACCOUNT WITH THE UNITED STATES APPROPRIATION UNDER THE HATCH ACT FOR 1915-16

Dr.

To receipts from the Treasurer of the United States, as per appropriation for the year ended June 30, 1916, as per act of Congress approved March 2, 1887	$15,000.00

Cr.

By expenditures for:		
Salaries	$5,153.56	
Wages	6,757.44	
Office supplies	.58	
General plant supplies	412.09	
Building materials	335.15	
General plant materials	99.11	
Office equipment	780.50	
Motorless vehicles and equipment	106.50	
Wearing apparel	3.50	
Educational and recreational equipment	2.70	
General plant equipment	1,045.31	
General repairs	18.20	
Communication	69.20	
General plant service	167.66	
Contributions	48.50	
Total		$15,000.00

STATEMENT B

Adams Fund

THE OHIO AGRICULTURAL EXPERIMENT STATION IN ACCOUNT WITH THE UNITED STATES APPROPRIATION UNDER THE ADAMS ACT FOR 1915-16

Dr.

To receipts from the Treasurer of the United States, as per appropriation for the fiscal year ended June 30, 1916, as per act of Congress approved March 16, 1906 ..... $15,000.00

Cr.

By expenditures for:		
Salaries	$3,240.13	
Wages	4,230.26	
Forage and veterinary supplies	313.73	
Office supplies	5.18	
Refrigerating supplies	40.00	
General plant supplies	1,078.31	
Building materials	215.46	
General plant materials	152.26	
Office equipment	345.50	
Livestock	706.00	
Motorless vehicles and equipment	165.00	
Educational and recreational equipment	413.72	
General plant equipment	3,685.89	
General repairs	332.02	
Transportation	20.62	
General plant service	20.92	
Contributions	35.00	
Total		$15,000.00

STATEMENT C

THE OHIO AGRICULTURAL EXPERIMENT STATION IN ACCOUNT WITH THE UNITED STATES PRODUCE FUND

Adams Produce Fund

Dr.

To Receipts

From Department of Chemistry	$ 1.00	
" Department of Nutrition	160.77	
" Department of Soils	23.02	
Total		$184.79

Cr.

By Expenditures

By balance forward 184.79

STATEMENT D

THE OHIO AGRICULTURAL EXPERIMENT STATION IN ACCOUNT WITH THE STATE AND PRODUCE FUNDS

Dr.

To Receipts

From State appropriations	$272,543.00	
" Department of Administration	1,477.76	
" Department of Agronomy	611.45	
" Department of Animal Husbandry	9,966.38	
" Department of Botany	23.00	
" Department of Chemistry	1.80	
" Department of Dairy Husbandry	5,207.08	
" Department of Forestry	96.11	
" Department of Horticulture	3,125.52	
" Department of Nutrition	54.95	
" Department of Soils	2,569.86	
Total		$295,676.91
To balance brought forward July 1, 1915		24,209.49
Total		$319,886.40

Cr.

By Expenditures

For Salaries	$117,204.02	
" Wages	45,893.02	
" Wages unclassified	256.27	
" Forage and veterinary supplies	16,157.95	
" Fuel supplies	4,497.81	
" Office supplies	1,648.70	
" Laundry, cleaning and disinfecting supplies	152.59	
" Refrigerating supplies	60.34	
" Botanical and agricultural supplies	2,338.25	
" General plant supplies	6,550.24	
" Building materials	4,202.17	
" General plant materials	1,599.86	
" Office equipment	954.68	
" Livestock	2,880.71	
" Motorless vehicles and equipment	428.50	
" Wearing apparel	25.71	
" Educational and recreational equipment	1,060.94	
" General plant equipment	10,801.71	
" General repairs	3,039.48	
" Light, heat and power	111.66	
" Transportation	17,704.69	
" Communication	395.21	
" General plant service	467.15	
" Rent	1,980.82	
" Insurance	93.00	
" Contributions	24.25	
Total expenditures		$240,529.73
State Treasury*		23,133.91
Lapsed to State Treasury		4,211.12
To balance forward		52,011.64
Total		$319,886.40

*Deposited in State Treasury to the credit of the General Revenue Fund.

STATEMENT E

THE OHIO AGRICULTURAL EXPERIMENT STATION IN ACCOUNT WITH THE STATE APPROPRIATIONS FOR ESTABLISHING STATE FORESTS

Dr.

To Receipts

State appropriation	$10,000.00

Cr.

By Expenditures

For Wages	$ 76.15	
" General plant service	1.10	
" Land	8,746.50	
Total		$ 8,823.75
To balance forward		1,176.25
Total		$10,000.00

STATEMENT F

TOTAL RECEIPTS AND EXPENDITURES OF THE OHIO AGRICULTURAL EXPERIMENT STATION FOR THE YEAR ENDED JUNE 30, 1916

Dr.

To Receipts

From United States appropriations	$ 30,000.00	
" State appropriations	282,543.00	
" Produce Funds	23,318.70	
Total		$335,861.70
To balance brought forward July 1, 1915		24,209.49
Total		$360,071.19

Cr.

By Expenditures

For Salaries	$125,597.71	
" Wages	56,956.87	
" Wages unclassified	256.27	
" Forage and veterinary supplies	16,471.68	
" Fuel supplies	4,497.81	
" Office supplies	1,654.46	
" Laundry, cleaning and disinfecting supplies	152.59	
" Refrigerating supplies	100.34	
" Botanical and agricultural supplies	2,338.25	
" General plant supplies	8,040.64	
" Building materials	4,752.78	
" General plant materials	1,851.23	
" Office equipment	2,080.68	
" Livestock	3,586.71	
" Motorless vehicles and equipment	700.00	
" Wearing apparel	29.21	
" Educational and recreational equipment	1,477.36	
" General plant equipment	15,532.91	
" General repairs	3,389.70	
" Light, heat and power	111.66	
" Transportation	17,725.31	
" Communication	464.41	
" General plant service	656.83	
" Land	8,746.50	
" Rent	1,980.82	
" Insurance	93.00	
" Contributions	107.75	
Total expenditures		$279,353.48
Lapsed to State Treasury		4,211.12
State Treasury*		23,133.91
Balance forward		53,372.68
Total		$360,071.19

*Deposited in State Treasury to the credit of the General Revenue Fund.

STATEMENT G

BALANCE SHEET, JUNE 30, 1916

Date of appropriation	Appropriation titles	Balance July 1, 1915	Appropriation	Receipts transfers	Total	Lapsed to State Treasury	Expenditures	Balance June 30, 1916
1913-14	Furniture and carpets	$ 25.58			$ 25.58	$ 25.58		
	Addition to Administration Building	.63			.63	.63		
	Addition to Power House equipment	.03			.03	.03		
1914-15	Salaries	.99			.99			$ 0.99
	Wages	3.02			3.02			3.02
	Food supplies	86.35			86.35			86.35
	Fuel supplies	190.73			190.73			190.73
	Office supplies	529.41			529.41			529.41
	Medical and surgical supplies	300.00			300.00			300.00
	Refrigerating supplies	171.97			171.97			171.97
	Botanical and agricultural supplies	9.05			9.05			9.05
	General plant supplies	888.38			888.38			888.38
	Building materials	52.21			52.21			52.21
	General plant materials	.24			.24			.24
	Office equipment	2.29			2.29			2.29
	Livestock	1.05			1.05			1.05
	Motorless vehicles and equipment	13.90			13.90			13.90
	Wearing apparel	14.22			14.22			14.22
	Educational and recreational equipment	.27			.27			.27
	General plant equipment	.55			.55			.55
	General repairs	1,568.57			1,568.57			1,568.57
	Transportation	1.15			1.15			1.15
	Communication	1.97			1.97			1.97
	Contingencies	490.00			490.00			490.00
1915	Salaries	3,969.80			3,969.80	3,969.80		
	Wages	326.71			326.71	210.96	115.75	
	Wages unclassified	257.00			257.00	.73	256.27	
	Forage and veterinary supplies	153.57			153.57		147.75	5.82
	Fuel supplies	617.85			617.85		455.18	162.67
	Office supplies	386.21			386.21		210 91	175.30
	Laundry, cleaning and disinfecting supplies	67.00			67.00		33.10	33.90

BALANCE SHEET, JUNE 30, 1916.—Continued.

Date of appropriation	Appropriation titles	Balance July 1, 1915	Appropriation	Receipts transfers	Total	Lapsed to State Treasury	Expenditures	Balance June 30, 1916
1915	Refrigerating supplies	$ 9.00			$ 9.00		$ 6.52	$ 2.48
	Botanical and agricultural supplies	2,586.87			2,586.87		278.65	Z 308.22
	General plant supplies	2,175.31			2,175.31		1,499.74	675.57
	Building materials	1,282.41		$ 2.50	1,284.91		1,284.73	.18
	General plant materials	34.67			34.67		† 2.50 29.29	2.88
	Office equipment	104.67			104.67		89.66	15.01
	Livestock	945.20			945.20		943.00	2.20
	Motorless vehicles and equipment	120.00			120.00		82.00	38.00
	Wearing apparel	8.52			8.52		8.04	.48
	Educational and recreational equipment	169.74			169.74		151.77	17.97
	General plant equipment	3,561.85			3,561.85		3,519.02	42.83
	General repairs	175.40			175.40		173.21	2.19
	Light, heat and power	108.88			108.88		5.90	102.98
	Transportation	2,298.91			2,298.91		1,419.87	879.04
	Communication	2.59			2.59		2.56	.03
	General plant service	243.88			243.88		174.87	69.01
	Rent	128.00			128.00		21.00	107.00
	Insurance	70.00			70.00		68.00	2.00
	Contributions	49.00			49.00			49.00
	Uses and purposes	3.89			3.89	$3.39	.50	
	Uses and purposes			23,133.91	23,133.91		*23,133.91	
	Salaries		$130,780.00		130,780.00		117,204.02	13,575.98
	Wages		50,000.00		50,000.00		45,777.27	4,222.73
	Food supplies		25.00		25.00			25.00
	Forage and veterinary supplies		15,000.00	2,000.00	17,000.00		16,010.23	989.80
	Fuel supplies		5,000.00		5,000.00		4,042.69	957.37
	Office supplies		2,200.00		2,200.00		1,437.70	762.21
	Laundry, cleaning and disinfecting supplies		125.00		125.00		119.49	5.51

*Deposited in State Treasury to the credit of the General Revenue Fund.
†Transfers.

BALANCE SHEET, JUNE 30, 1916.—Concluded

Date of appropriation	Appropriation titles	Balance July 1, 1915	Appropriation	Receipts transfers	Total	Lapsed to State Treasury	Expenditures	Balance June 30, 1916
1915	Refrigerating supplies		$ 85.00		$ 85.00		$ 53.82	$ 31.18
	Botanical and agricultural supplies		2,700.00		2,700.00		2,059.60	640.40
	General plant supplies		11,000.00		11,000.00		† 12,000.00 † 5,050.50	† 3,949.50
	Highway materials		500.00		500.00			500.00
	Building materials		3,000.00		3,000.00		2,917.44	82.56
	General plant materials		2,000.00		2,000.00		1,570.57	429.43
	Office equipment		1,000.00		1,000.00		865.02	134.98
	Livestock		3,500.00		3,500.00		1,937.71	1,562.29
	Motorless vehicles and equipment		500.00		500.00		346.50	153.50
	Wearing apparel		25.00		25.00		17.67	7.33
	Educational and recreational equipment		1,000.00		1,000.00		909.17	90.83
	General plant equipment		18,000.00		18,000.00		7,282.69	10,717.31
	General repairs		3,000.00		3,000.00		2,866.27	133.73
	Light, heat and power		300.00		300.00		105.76	194.24
	Transportation		17,800.00		17,800.00		16,284.82	1,515.18
	Communication		405.00		405.00		392.15	12.85
	Contingencies		1,000.00		1,000.00			1,000.00
	General plant service		300.00		300.00		292.28	7.72
	Rent		3,223.00		3,223.00		1,959.82	1,263.18
	Insurance		50.00		50.00		25.00	25.00
	Contributions		25.00		25.00		24.25	.75
	Establishing state forests		10,000.00		10,000.00		8,823.75	1,176.25
	Adams Fund		15,000.00		15,000.00		15,000.00	
	Hatch Fund		15,000.00		15,000.00		15,000.00	
	Adams Produce Fund			$ 184.79	184.79			184.79
	Total	$24 209.49	$312 543.00	$23,318.70 † 2 002.50	$360,071.19 2,002.50	$4 211.12	$279,353.48 * 23,133.91 † 2 002.50	$53,372.68

*Deposited in State Treasury to the credit of the General Revenue Fund.
†Transfers.

APPENDIX

Publications

of the

Ohio Agricultural Experiment Station

for year ended June 30, 1916

CONTENTS

PART I—BULLETINS

PART II—CIRCULARS

(Vol. I, Nos. 1-6 of the Monthly Bulletin, published during the fiscal year ended June 30, 1916, are found in another volume, which includes only the monthly publications.)

INDEX

*Cf. Monthly Bulletin, Vol. I.

INDEX

*Cf. Monthly Bulletin, Vol. I.

*Cf. Monthly Bulletin, Vol. I.